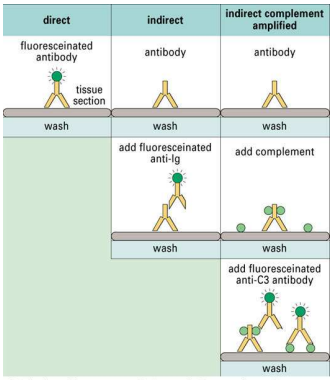
Immunofluorescenza diretta ed indiretta



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Immunofluorescenza ed immunomicroscopia elettronica

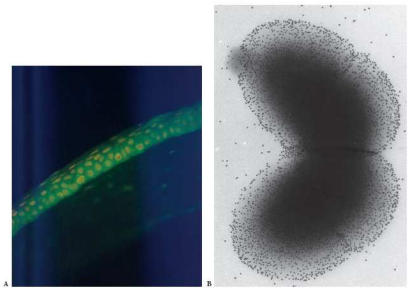
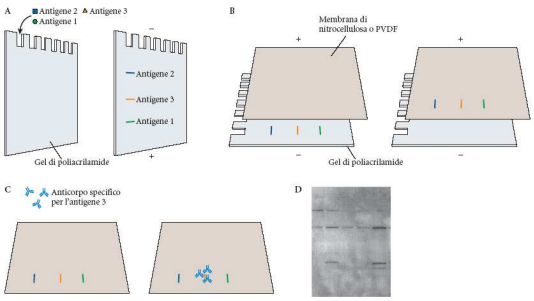


Figura 9.14 L'uso di anticorpi per la rivelazione di antigeni in microscopia. (**A**) L'immunoistochimica a fluorescenza permette di rilevare antigeni mediante la microscopia a fluorescenza. In questo caso, l'antigene d'interesse (una proteina di un canale ionico) viene rilevato sull'epitelio con l'uso di un anticorpo covalentemente coniugato alla sonda verde l'isotiocianato di fluorescetina. (**B**) In microscopia elettronica gli antigeni sono legati da anticorpi covalentemente coniugati a particelle d'oro. L'anticorpo primario è in questo esempio diretto contro il polisaccaride capsulare o di superficie del batterio (*Enterococcus faecalis*) e il legame di questo anticorpo IgG viene rilevato dall'aggiunta della proteina A (una proteina che lega le IgG) coniugata a particelle d'oro di 20 nanometri.

Immunoblot o Western blot



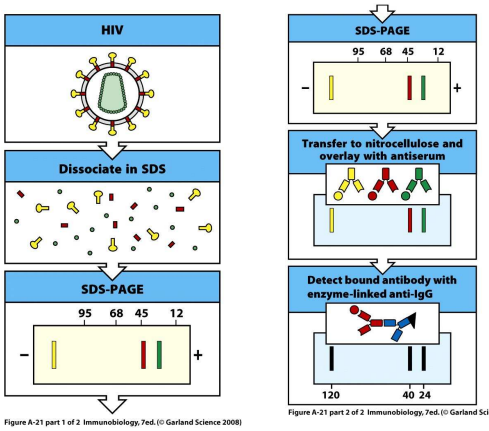


Figure A-21 part 1 of 2 Immunobiology, 7ed. (© Garland Science 2008)

Figure A-21 part 2 of 2 Immunobiology, 7ed. (© Garland Science 2008)

LEZIONE 14

Sviluppo e sopravvivenza dei linfociti

Il complesso recettoriale di membrana nei linfociti B e T

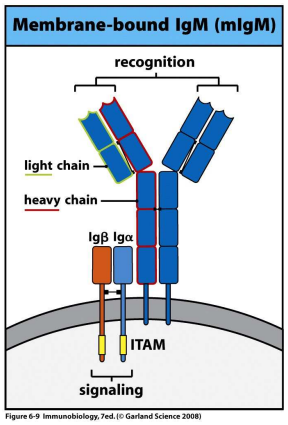


Figure 6-9 Immunobiology, 7ed. (© Garland Science 2008)

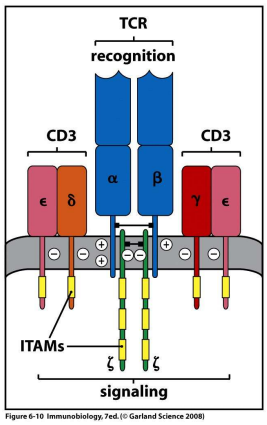
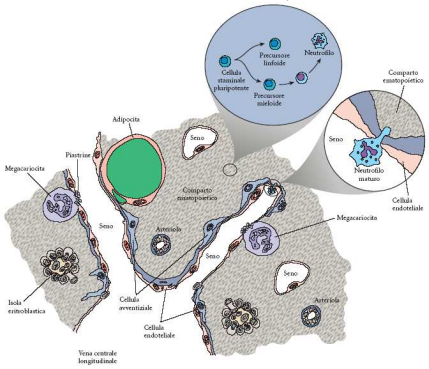


Figure 6-10 Immunobiology, 7ed. (© Garland Science 2008)

Il midollo osseo è sede della linfopoiesi B



Compartimento vascolare ed emopoietico

Fasi schematiche della maturazione dei linfociti B

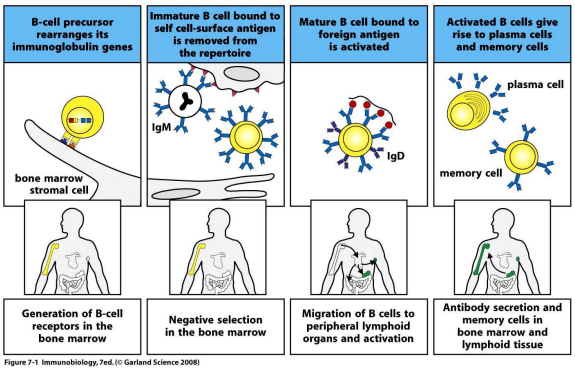


Figure 7-1 Immunobiology, 7ed. (© Garland Science 2008)

Cellule staminali emopoietiche e linfopoiesi: ruolo dei fattori trascrizionali

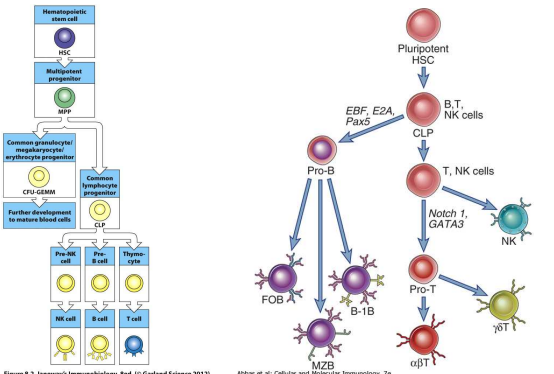


Figure 8.2 Janeway's Immunobiology, 8ed. (© Garland Science 2012)

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Cellule stromali (avventiziali) del midollo osseo sostengono le fasi iniziali della linfopoiesi B

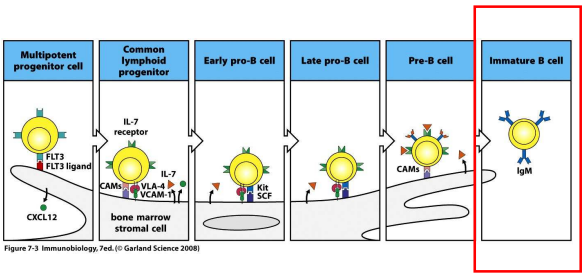


Figure 7-3 Immunobiology, 7ed. (© Garland Science 2008)

Secondary lymphoid organs

Geni regolatori delle fasi precoci:
fattori di crescita e fattori trascrizionali

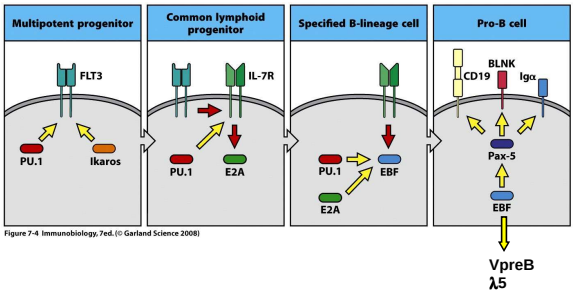


Figure 7-4 Immunobiology, 7ed. (© Garland Science 2008)

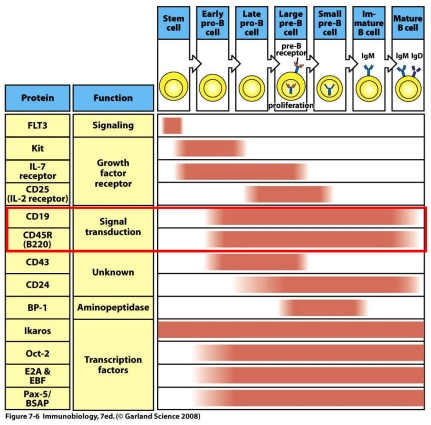


Figure 7-6 Immunobiology, 7ed. (© Garland Science 2008)

Riarrangiamento dei geni delle immunoglobuline e stadi maturativi

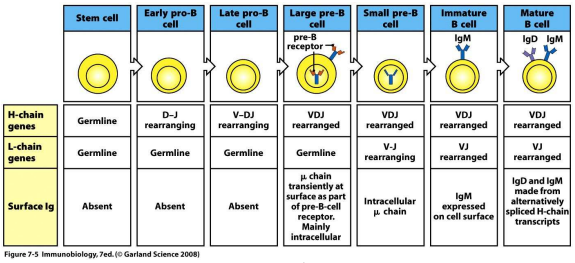
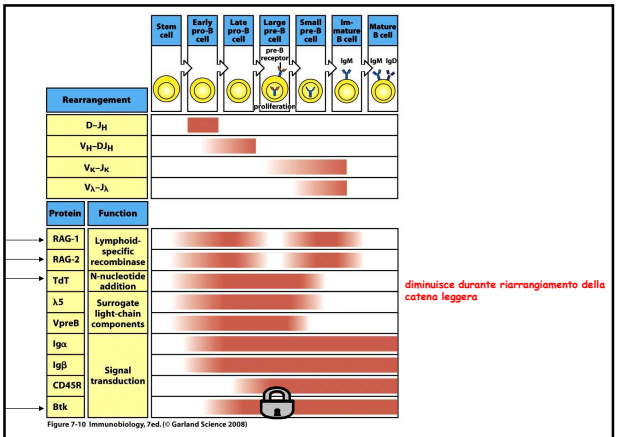


Figure 7-5 Immunobiology, 7ed. (© Garland Science 2008)

45% loss of B cells (failure in productive rearrangement in two chromosomes)



diminuisce durante riarrangiamento della catena leggera

Figure 7-10 Immunobiology, 7ed. (© Garland Science 2008)

Agammaglobulinemia di Bruton legata al cromosoma X (XLA)

Espressione sequenziale dei complessi recettoriali di superficie

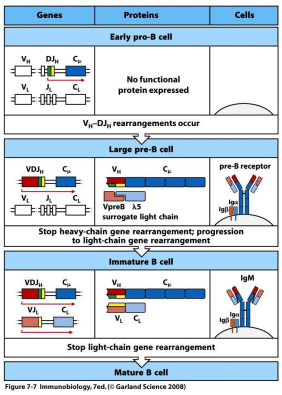


Figure 7-7 Immunobiology, 7ed. (© Garland Science 2008)

Amino-terminal tails on VpreB and λ5 in adjacent pre-B-cell receptor molecules bind each other and cross-link the receptors, inducing clustering and signaling

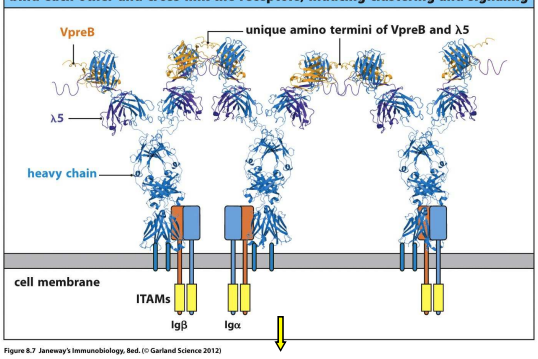


Figure 8.7 Janeway's Immunobiology, 8ed. (© Garland Science 2012)

stop riarrangiamento catena pesante espressione IL-7R e proliferazione

Dimostrazione dell'esclusione allelica in singole cellule B

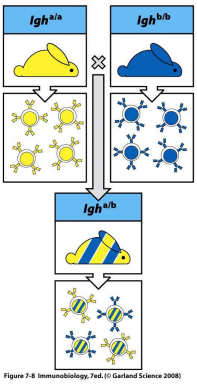


Figure 7-8 Immunobiology, 7ed. (© Garland Science 2008)

Riarrangiamento dei geni delle immunoglobuline e stadi maturativi

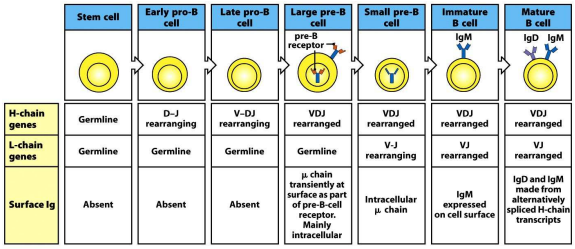


Figure 7-5 Immunobiology, 7ed. (© Garland Science 2008)

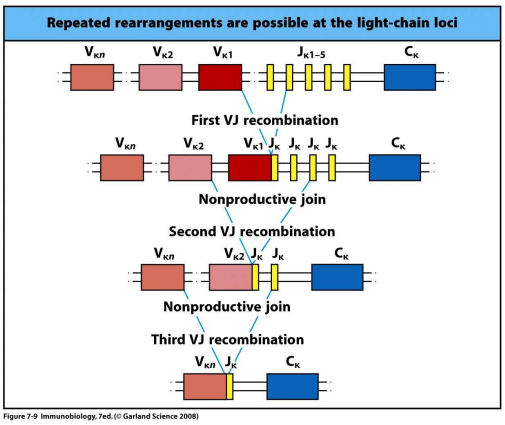


Figure 7-9 Immunobiology, 7ed. (© Garland Science 2008)

Passaggi del riarrangiamento in cui i linfociti B possono essere persi

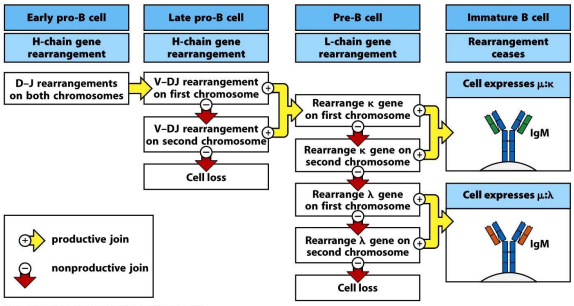


Figure 7-11 Immunobiology, 7ed. (© Garland Science 2008)

Esclusione isotipica

Destino dei linfociti B in base al legame con l'antigene nel midollo osseo

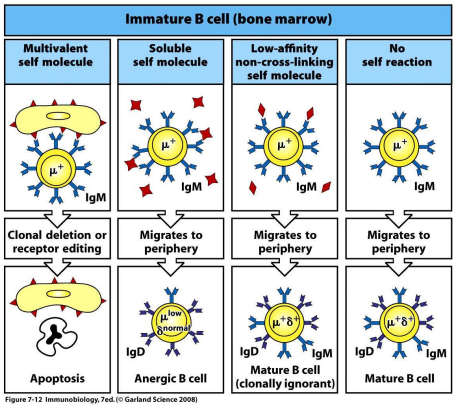


Figure 7-12 Immunobiology, 7ed. (© Garland Science 2008)

Revisione del recettore e recupero dei linfociti B

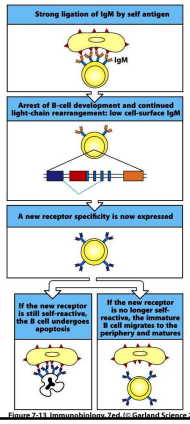
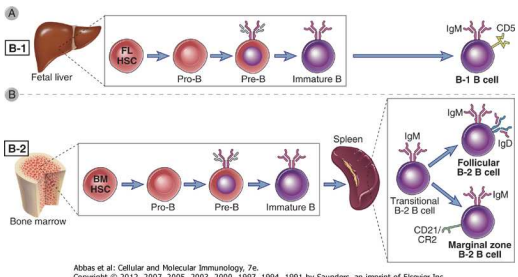


Figure 7-13 Immunobiology, 7ed. (© Garland Science 2008)

Sottopopolazioni dei linfociti B



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Fasi schematiche della maturazione dei linfociti T

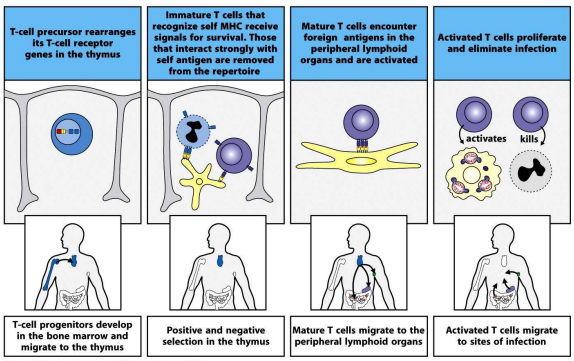


Figure 7-14 Immunobiology, 7ed. (© Garland Science 2008)

Cellule staminali emopoietiche e linfopoiesi: ruolo dei fattori trascrizionali

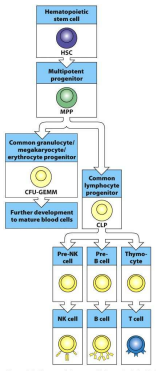
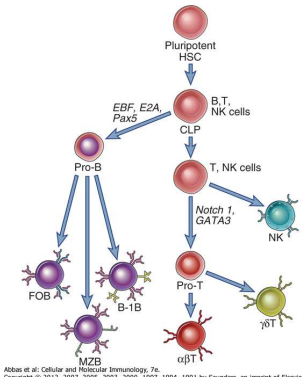


Figure 8.2 Janeway's Immunobiology, 8ed. (© Garland Science 2012)



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Il timo

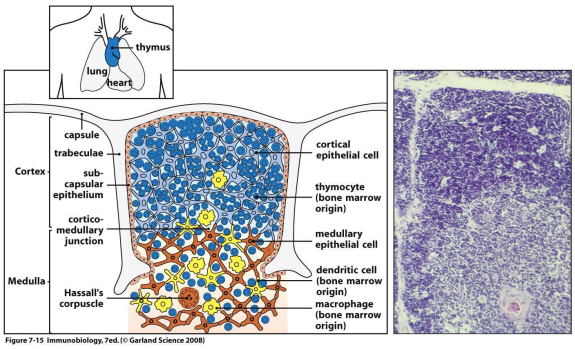


Figure 7-15 Immunobiology, 7ed. (© Garland Science 2008)

Mutazione gene DNA-PK

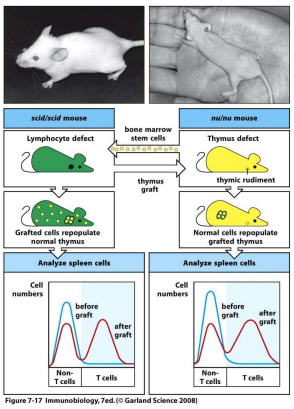


Figure 7-17 Immunobiology, 7ed. (© Garland Science 2008)

Mutazione gene Foxn1

Sindrome di DiGeorge: delezione del cromosoma 22q11

Maturazione timica delle due principali popolazioni di linfociti T

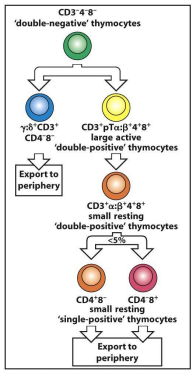


Figure 8.19 Janeway's Immunobiology, 8ed. (© Garland Science 2012)

Commitment solo dopo 7 gg nel timo (antigene Thy1 nel topo e CD2 nell'uomo)

DN precursori linfociti αβ
DN linfociti γδ
DN linfociti NKT

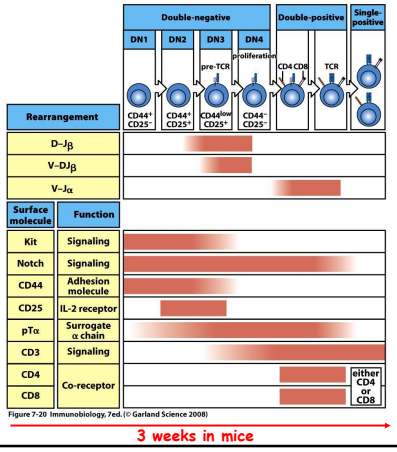


Figure 7-20 Immunobiology, 7ed. (© Garland Science 2008)

3 weeks in mice

Compartimenti nella maturazione dei timociti

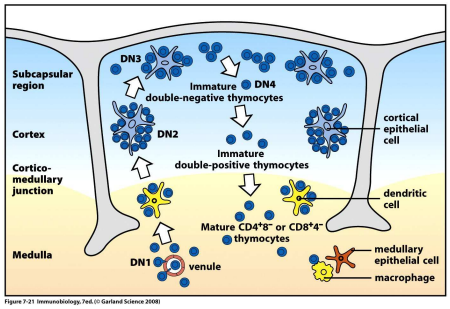
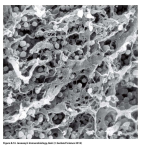


Figure 7-21 Immunobiology, 7ed. (© Garland Science 2008)



Competizione fra i segnali trasmessi da TCR γδ e pre-TCR nel determinare il destino dei timociti

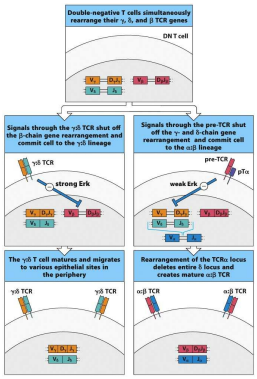
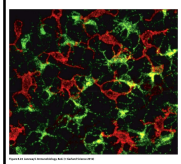


Figure 8.22 Janeway's Immunobiology, 8ed. (© Garland Science 2012)

Ontogenesi di sottopopolazioni timiche nel topo



Dendritic epidermal T cells

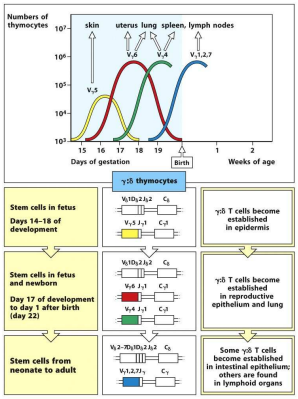


Figure 8.23 Janeway's Immunobiology, 8ed. (© Garland Science 2012)

Mancano nucleotidi N (TdT assente)

Nucleotidi N (TdT presente)

Stadi nel riarrangiamento genico nei linfociti T αβ

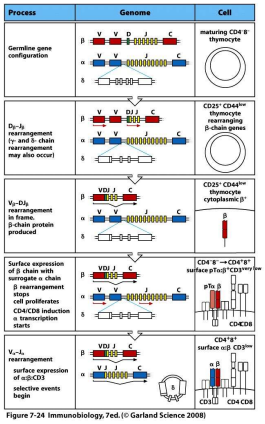


Figure 7-24 Immunobiology, 7ed. (© Garland Science 2008)

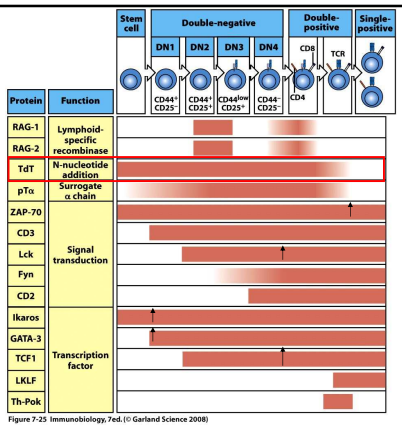


Figure 7-25 Immunobiology, 7ed. (© Garland Science 2008)

↑ indica lo stadio in cui si arresta la maturazione in assenza del gene

Riarrangiamenti successivi della catena α del TCR: assenza di esclusione allelica

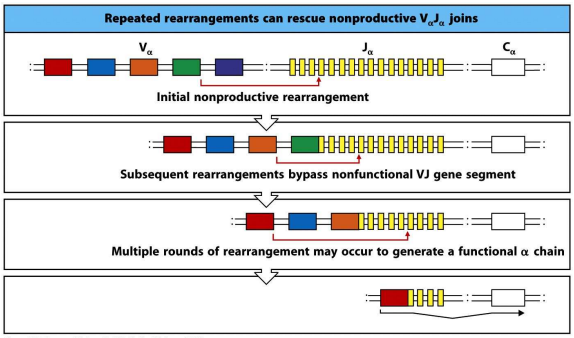


Figure 7-26 Immunobiology, 7ed. (© Garland Science 2008)

I linfociti T possono avere due catene α del TCR: selezione positiva solo per una

Ruolo del MHC nella selezione positiva

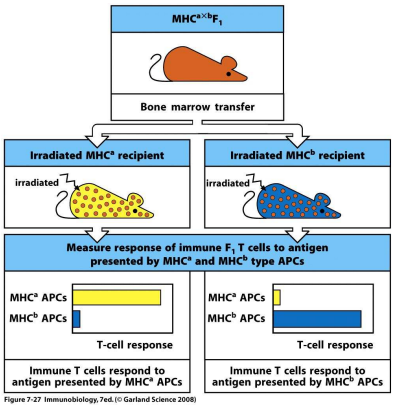


Figure 7-27 Immunobiology, 7ed. (© Garland Science 2008)

Ruolo del MHC nella selezione positiva

Bone marrow donor	Recipient	Mice contain APC of type:	Secondary T-cell responses to antigen presented *in vitro* by APC of type:	
			MHC^a APC	MHC^b APC
$MHC^{a\times b}$	MHC^a	$MHC^{a\times b}$	Yes	No
$MHC^{a\times b}$	MHC^b	$MHC^{a\times b}$	No	Yes
MHC^a	MHC^b	MHC^a	No	No